

Original Research Article

Non-communicable disease risk factor profile among Fishermen community of Kancheepuram district, Tamil Nadu: a cross sectional study

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ABSTRACT

Background: Owing to growing epidemic of non communicable diseases (NCD), identification of risk factor profile is one of the high-priority actions required in reducing NCDs. Further, fishermen community possesses unique characteristics of a folk society despite the urban environment around it. Since major portion of the life of fishermen is spent at sea with bizarre sleep and eating pattern, their risk profile for non-communicable disease are different from general population. The objectives of the study were to assess the prevalence of risk factors for non-communicable diseases (NCDs) among fishermen community in Kancheepuram district, Tamil Nadu; to identify the association of the NCD risk factors with socio-demographic and occupational characteristics of the study participants.

Methods: This was a descriptive cross sectional study conducted among 210 adult male Fishermen community of Kovalam, Kalpakkam and Mahabalipuram, of Kancheepuram district, Tamil Nadu during May to October, 2016 using a semi-structured questionnaire and all the participants were motivated to undergo laboratory investigations.

Results: Prevalence of smoking tobacco form, smokeless tobacco use and alcohol use were 17.1%, 22.9% and 61.4% respectively. Mean blood pressure observed in our study was 120.14/77.86 mm Hg. Prevalence of hypertension was 39.05% and 13.3% were having abdominal obesity.

Conclusions: NCD risk factors like hypertension, alcohol use was quite high in this fishermen community and it needs further evaluation.

Keywords: Non communicable diseases, Fishermen, Risk factor, Tobacco, Alcohol

INTRODUCTION

The Global status report on Non-Communicable Diseases by World Health Organization (WHO) has estimated that every year, nearly 28 million people lose their lives to NCDs.¹ Four groups of diseases namely, cardiovascular diseases, cancers, respiratory diseases and diabetes account for 82% of these deaths.¹ In India, NCDs account for 60% of the total deaths.² Owing to lengthy course and

expensive treatment, NCDs cause a significant drain in resources of low-income families. The resultant poverty impedes health-seeking by poor families which further potentiates NCD progression, evoking a vicious cycle. Low-cost solutions aimed at preventing major risk factors at individual and community level have huge potential to substantially minimize NCD burden. Hence identification of risk factor profile of a population is one of the high-priority actions required in reducing NCDs.¹

Further, fishermen community possesses unique characteristics of a folk society, since major portion of the life of fishermen is spent at sea with bizarre sleep and eating pattern, their risk profile for NCDs are different from general population.³ Since limited studies were done among fishermen community, this study was planned to explore the risk factor profile for NCDs among fishermen community in Kancheepuram district, Tamil Nadu.

METHODS

This was a descriptive cross sectional study conducted among 210 adult Male Fishermen community of Kovalam, Kalpakkam and Mahabalipuram, of Kancheepuram district, Tamil Nadu during May to October, 2016 using a semi-structured questionnaire and all the participants were motivated to undergo laboratory investigations. The sample size was calculated on the basis of prevalence of hypertension among fishermen community (4.62%), Mangalore, as reported by Mudgal SM et al was used to calculate the required sample size.⁴ Assuming, 10% non-response rate, the final sample size is approximated to 210. A multi-stage sampling method was used. A proportionate sample of 70 participants was chosen from each village by simple random sampling.

Institution Ethics Committee approval was obtained. Informed consent was obtained from participants. A semi-structured schedule has been prepared in local language Tamil based on WHO STEPS Schedule and integrated disease surveillance project (IDSP) NCD risk factor surveillance survey.^{5,6} Considering logistic constraints, biochemical investigations were not performed at field level and all the participants were motivated to undergo laboratory investigations for blood sugar and lipid profile in our Institution.

The data entry and statistical analysis were performed using SPSS 23. Descriptive data was expressed as frequencies and percentages. Chi-square test was used to analyze the significance of associations and P value of less than 0.05 was considered significant.

RESULTS

All the study participants were belonging to Hindu religion and the mean age was 43.05 and 73.3% belonging to nuclear family and 89.5% were currently married (Table 1).

Table 1: Socio-demographic profile of the study population (N=210).

| Variable | Frequency (%) |
|---|-----------------------------|
| Total | 210 (100) |
| Age group | 18-25 years |
| | 28 (13.3) |
| | 26-35 years |
| | 30 (14.3) |
| | 36-45 years |
| Type of family | 48 (22.9) |
| | 46-55 years |
| | 72 (34.3) |
| Marital status | 56-65 years |
| | 32 (15.2) |
| Education | Nuclear family |
| | 154 (73.3) |
| Socio-economic classification²³ | Joint family |
| | 56 (26.7) |
| | Single |
| | 22 (10.5) |
| | Currently married |
| | 188 (89.5) |
| | No schooling |
| Education | 3 (1.4) |
| | Less than primary education |
| | 23 (11) |
| | Primary education completed |
| | 113 (53.8) |
| Socio-economic classification²³ | High school completed |
| | 47 (22.4) |
| | Higher secondary completed |
| | 13 (6.2) |
| Education | College education completed |
| | 11 (5.2) |
| | Class II |
| | 21 (10) |
| | Class III |
| Socio-economic classification²³ | 79 (37.6) |
| | Class IV |
| | 73 (34.8) |
| Education | Class V |
| | 37 (17.6) |

Regarding their occupation as fishermen, mean years of working was 22.73 with range of 1 to 45 years. On average, they were going for five days per week for fishing with range of 1 to 7 days. In a typical working day, on average they were spending 5.85 hours in sea.

Prevalence of current smoking was 17.1% and ever smoker were 20.5%, average age of initiation of smoking

was 21 with range of 15 to 40 years (Table 2). Among the ever smokers (n=43), 41.86% were using beedi, 36.5% used both beedi and cigar, 11.63% used cigarettes and 6.98% used cigars alone. All the current smokers were smoking for all days in the previous month and smoked 6 to 8 cigarettes/beedi or cigars. About 3.8% of their family had someone having the habit of smoking. And about 25% of current smokers had tried to reduced or stopped smoking as a conscious decision.

Table 2: Key risk factors for non communicable disease (N=210).

| Variable | Key Risk factors | | Frequency (%) | |
|-------------------------|------------------------|----------------|------------------|------------|
| Behavioral risk factors | Smoking | Yes | 36 (17.1) | |
| | | No | 174 (82.9) | |
| | Smokeless tobacco use | Yes | 48 (22.9) | |
| | | No | 162 (77.1) | |
| | Alcohol use | Yes | 129 (61.4) | |
| | | No | 81 (38.6) | |
| Physical measures | BMI (kg/m²) | Under weight | 13 (6.2) | |
| | | Normal | 126 (60) | |
| | | Overweight | 79 (37.6) | |
| | | Obese stage I | 8 (3.8) | |
| | | Obese stage II | 3 (1.4) | |
| | Abdominal obesity | Yes | 28 (13.3) | |
| | | No | 182 (86.67) | |
| | Blood pressure (mm hg) | Systolic BP | Normal | 147 (70) |
| | | | Pre-hypertension | 29 (13.8) |
| | | | Hypertension | 34 (16.2) |
| | | Diastolic BP | Normal | 155 (73.8) |
| | | | Pre-hypertension | 2 (1) |
| Hypertension | | | 53 (25.2) | |

Table 3: Consumption of food in the past 6 months (N=210).

| Food item | Never (%) | <1 time/ month (%) | 2-3 times/ month (%) | 1-2 times/ week (%) | 3-4 times/ week (%) | ≥ 5 times/ week (%) |
|------------------------------|-----------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
| Fried local foods | 20 (9.5) | 32 (15.2) | 123 (58.6) | 33 (15.7) | 1 (0.5) | 1 (0.5) |
| Red meat | 41 (19.5) | 44 (21) | 90 (42.9) | 33 (15.7) | 1 (0.5) | 1 (0.5) |
| Eggs | 2 (1) | 2 (1) | 29 (13.8) | 136 (64.8) | 38 (18.1) | 3 (1.4) |
| Chicken | 3 (1.4) | 6 (2.9) | 106 (50.5) | 87 (41.4) | 7 (3.3) | 1 (0.5) |
| Fish | - | - | - | 2 (1) | 60 (28.6) | 148 (70.5) |
| Aerated/ sweetened drinks | 20 (9.5) | 4 (1.9) | 84 (40) | 90 (42.9) | 11 (5.2) | 1 (0.5) |
| Bakery products | 22 (10.5) | 2 (1) | 90 (42.9) | 84 (40) | 11 (5.2) | 1 (0.5) |
| Coffee/Tea | 5 (2.4) | - | - | - | 54 (25.7) | 151 (71.9) |

Table 4: Lipid profile of the study population (N=104)

| Parameters | Description | Frequency (%) |
|-----------------------------|---------------------------------|---------------|
| Total cholesterol | Desirable (≤ 200 mg/dl) | 64 (61.54) |
| | Borderline high (201-239 mg/dl) | 26 (25) |
| | High (≥ 240 mg/dl) | 14 (13.46) |
| Triglycerides | Desirable (≤ 150 mg/dl) | 59 (56.73) |
| | High (≥ 151 mg/dl) | 45 (43.27) |
| LDL Cholesterol | Desirable (≤ 130 mg/dl) | 86 (82.69) |
| | High (> 131 mg/dl) | 18 (17.31) |
| HDL | Major risk (≤ 40 mg/dl) | 70 (67.31) |
| | Borderline risk (41-59 mg/dl) | 29 (27.88) |
| | Less risk (≥ 60 mg/dl) | 5 (4.81) |
| VLDL Cholesterol | Desirable (≤ 100 mg/dl) | 100 (96.15) |
| | High (> 101 mg/dl) | 4 (3.85) |
| Total cholesterol/HDL ratio | Low risk | 73 (70.19) |
| | High risk | 31 (29.81) |

Prevalence of smokeless tobacco was 22.9% and ever smokeless tobacco user were 28.6%, mean age of initiation was 22.62 with standard deviation of 6.02 and of range 15 to 40 years (Table 2). All of them were using hams and consuming all the days in the previous month and were having one per day.

The prevalence of alcohol use was 61.4% and average age of initiation was 22.71 with range of 15 to 45 years. They were consuming all days in the previous month and had an average of 180 ml mainly brandy (69.48%) followed by both beer and brandy (16.88%) and beer alone (13.64%) (Table 2).

Mean BMI of our study population was 23.39 with range between 14.72 to 36.89 kg/m². Mean waist circumference was 79.66cms with range of 59 to 105cms and 13.3% was having abdominal obesity (Table 2).

Among the study population (N=210), all were having fruits in the previous week. In a typical week on average they were consuming fruits for 2.79 days with range of 1 to 7 days. They were having an average of 280 grams of fruits mainly banana.

Regarding vegetables intake, all were having vegetables in the previous week. In a typical week, on average they were having vegetables for 2.4 days with range of 1 to 5 days. On average, they were consuming 306.67grams of vegetables on those days. About 98.57% of the study population had food from hotels and restaurants.

Nearly 96.67% of the study population mentioned that they were using sunflower oil for cooking followed by 2.38% for palm oil and 0.95% for gingely oil. About 21.62% were consuming one spoon of salt for a meal on average and 72.4% were consuming two spoon of salt on average per meal per day. About 84.3% described their daily salt intake as medium, 15.2% told it as low and only 0.5% mentioned the salt intake as high.

About 70.5% was consuming fish daily and 71.9% was having either coffee or tea daily. Moreover, fried local foods were consumed by 58.6%, two to three times a month and 64.8% were having egg one to twice a week (Table 3).

In a typical week, on average they were involved in moderate to vigorous physical activity for 3.77 days with range of 1 to 6 days. On average they spent 2.42 hours for such moderate to vigorous physical activity with range of 1 to 4 hours. On average, they were spending 7.14 hours for sleeping per day with range of 4 to 11 hours. For sitting and reclining they were spending 2.4 hours on average with range of 1 to 5 hours.

Self reported diabetic mellitus and hypertensive patients were 11.4% and 13.33% respectively. The prevalence of hypertension was 39.05% in our study. Mean systolic blood pressure was 120.14 with range of 90 to 190mm Hg. Mean diastolic blood pressure was 77.86 with range

of 60 to 110 mm Hg. About 29% had family history of diabetes and 24.3% had family history of hypertension. Moreover, 0.5% had either family history of stroke and coronary heart disease.

Among 138 who gave consent for capillary blood glucose, 33.33% were having fasting capillary blood glucose value ≥ 110 mg/dl. Among self reported diabetic patients (n=24), 62.5% were having fasting capillary blood glucose value ≥ 110 mg/dl. Among those who gave blood for fasting lipid profile (n=104), 13.46% were having high cholesterol, 43.27% were having high triglycerides and 67.31% were having low HDL (Table 4).

Age group is significantly associated with BMI classification ($p < 0.0001$), abdominal obesity ($p < 0.05$), systolic hypertension ($p < 0.0001$) and diastolic hypertension ($p < 0.001$). Marital status was significantly associated with BMI classification ($p < 0.0001$), systolic hypertension ($p < 0.0001$), diastolic hypertension ($p < 0.0001$). Years of work as fishermen was significantly associated with systolic blood pressure ($p < 0.0001$), diastolic blood pressure ($p < 0.001$), BMI classification ($p < 0.015$) and waist circumference ($p < 0.002$).

DISCUSSION

This study to assess the prevalence of risk factors for NCDs found that the prevalence for smoking was 17.1% among our fishermen community. This observation was nearly similar to the findings documented in Sri Lankan study and District Level Household survey (DLHS) 4 in Tamil Nadu where the observation were 22.8% and 15.4% respectively.^{7,8} And our findings was lower than those observed from Percin et al of Turkey (81%), Lawrie et al of Scotland (38%), Greek study by Frantzeskou et al (40%), Begossi et al of Brazil (33%) and Mumbai study by Bhodve et al (73.4%).^{5-8,10,15} The higher prevalence was attributed towards misconception that tobacco use might increase their work efficiency as reported by Bhodve et al of Mumbai.¹⁵ On the other hand, the observations from Mudgal et al of Mangalore among fishermen community (4.3%) was lower than our findings.¹⁴ In our study, average cigarettes/beedi/cigar smoked per day was 7.7 and in IDSP survey in Tamil Nadu reported the mean cigarette to beedi smoking was 3 to 9 per day.²⁰

For smokeless tobacco use, the prevalence was 22.9% in our study, and the Global Adult Tobacco Survey in India among general population yielded quite higher prevalence of 32.9%.¹³ Contrary to these findings, DLHS 3 report from Tamil Nadu showed lower prevalence of 9.4% and IDSP survey in Tamil Nadu reported 11% prevalence. These difference might be due to difference in study population.^{19,20}

Prevalence of alcohol use was 61.4% in our study and this finding was relatively high and the participants cited that alcohol use will decrease their physical pain of heavy

work load. Similar finding was observed from Percin et al of Turkey (68%) and Mumbai study by Bhodve et al (63.4%).^{5,15} But our findings are widely lower than the prevalence obtained from DLHS 3 (19.3%) and NFHS-4 findings (46%).^{19,21} Scotland study reported 80% prevalence for alcohol use, and this finding was quite high compared to our study finding and the reason cited was extreme cold weather during fishing.⁶ Again the reason for wide variation of alcohol use might be due to socio-demographic differences.

In our study, average intake of fruits and vegetables were 2.79 days and 2.4 days per week respectively. This wasn't satisfactory when compared to the Sri Lankan study where the mean number of days of fruits and vegetables intake was 3.6 and 6.6 respectively.¹¹ But our findings of mean fruit intake were similar to IDSP survey report where it was 2 days in a week.²⁰ Edible oil commonly used by our study population was sunflower oil (96.67%) followed by 2.38% for palm oil and 0.95% for gingelly oil. In IDSP survey report, their findings were different; 41% consumed groundnut oil, 30% consumed sunflower oil and 12% consumed palm oil. This difference might be due to geographical variation. In our study population, 0.5% was consuming bakery items daily, but in IDSP survey report, it was 3% consumption daily. In our study, fish was the single largest consumption per day (70.5%) because of the easy availability and cost effectiveness, but in IDSP survey report, the consumption was 22% for fish daily.²⁰

Our finding of obesity rate (5.2%) was low when compared to Nicaragua study where they documented 22% of study population as obese.¹² Mean BMI was 23.39 kg/m² in our study population and similar findings were reported from Brazilian study (24.16 kg/m²) and IDSP survey report of Tamil Nadu (22 kg/m²).^{11,20}

Abdominal obesity was present in 13.3% of our study population which was similar to the findings (12.2%) documented from WHO-ICMR study.¹⁷ But higher observations were documented in coastal Karnataka study (30.9%).¹⁶ Prevalence of obesity and abdominal obesity was low compared to other studies, and consuming fish daily might be the reason for this satisfactory report.

In our study, self reported hypertension was 13.33% and this was quite high compared to WHO-ICMR study, where the self reported hypertension was 7.2% in their study population.¹⁷ Mean systolic blood pressure was 120.14mm Hg and mean diastolic blood pressure was 77.86mm Hg in our study population, this was quite similar to the findings documented from Brazil study where the mean systolic blood pressure was 127.22 mm Hg and mean diastolic blood pressure was 74.44 mm Hg. The prevalence of hypertension was 39.05% in our study population and this was comparatively high than Brazilian study (11%) and Mangalore study (4.62%) in their fishermen population.¹⁰ This higher prevalence in

our study might be due to high salt intake in the form of dry fish by this fishing population.

Our study documented, self reported diabetes mellitus as 11.4%, and this was similar to findings from coastal Karnataka where it was 11.2%.¹⁶ In our study, among those who gave consent for fasting capillary blood glucose (n=138), 26.8% were having fasting capillary blood glucose between 111 to 199mg/dl and 6.5% were having fasting capillary blood glucose above 200 mg/dl. In DLHS study, 13% were having fasting blood glucose above 140mg/dl and 8% were having fasting blood glucose above 160mg/dl.¹⁹

Among those who gave blood for lipid profile (n=104), about 13.46% were having high cholesterol. This was higher than the findings of 5.35% observed in Parauraman et al in fishermen community.²²

Age group is significantly associated with BMI classification, abdominal obesity, systolic and diastolic hypertension. Similar finding was observed in Nicaragua study, where the age was significantly associated with obesity.¹²

CONCLUSION

To conclude, the NCD risk factors like hypertension, alcohol use and tobacco use were quite high in this fishermen community and it needs further evaluation.

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